Amendments To The Drawings:

The attached sheets of drawings include changes to FIG. 1-3 and FIG. 7. These sheets, which

include FIG. 1-7, replace the original sheets including FIG. 1-7.

Attachment: Replacement Sheets
                    Annotated Sheets Showing Changes

REMARKS

This paper is being provided in response to the November 29, 2004 Office Action for the above-referenced application. The Office Action mailed November 29, 2004 has been carefully considered. Reconsideration and allowance of the subject application, as amended, is respectfully requested.

In the specification, the paragraphs 7, 24, 26, 28, 30, 31, 32, 39, 43 and 44 have been amended to correct minor editorial problems.

This application was examined with Claims 1 through 16. This amendment amends Claims 1, 4, 7 and 8. Applicants respectfully submit that the modifications to the claims are all supported by the originally-filed application.

Applicants gracefully acknowledge that the information disclosure statement (IDS) submitted on August 6, 2001 was considered by the Examiner.

The Examiner has objected to the Drawings as failing to comply with 37 CFR 1.84(p)(5). Applicants have amended Figures. 1-3, and 7 to overcome this objection. Additionally, amendments to the Specification have been made to overcome the objection to missing reference numbers in relation to Figures 1, 2, and 5 (see details below). Replacement Drawing Sheets in compliance with 37 CFR 1.121(d), which include amended Figures 1-3, and 7 are provided herewith. In view of these changes, mentioned above, and detailed below, Applicants respectfully request withdrawal of the objection to the drawings.

The objections to drawings under 37 CFR 1.84(p)(5) as multiple reference numbers are missing from the specification has been addressed. Applicants respectfully indicate that Figure 1,

"34, 36, 37, 39" are described in the paragraph [0004] of the specification. Applicants

respectfully indicate that Figure 2, "50" is described in the paragraph [0006] and Figure 5, "120"

is described in the paragraph [0044] of the specification. All other missing reference numbers

from the specification has been addressed by amendments to the specification contained herein.

The reference numbers are added in the specification as to their description.

The objections to drawings for black boxes in Figures 2, 3, and 7 under 37 CFR 1.121(d)

have been addressed by amendments to the drawings contained herein. New labels are added for

black boxes as to their function in Figures 2, 3, and 7.

35 U.S.C. §112 Rejections

The rejection of Claims 1-10 under 35 U.S.C. 112, second paragraph, has been addressed

by amendments to Claims 1, 4, 7 and 8.   Applicants respectfully submit that this amendment is

supported by the specification, for example, page 12, paragraph [0029] for the second storage

system is geographically removed from the storage system.   Accordingly, Applicants

respectfully request that this rejection be withdrawn.

35 U.S.C. §103(a) Rejections

The Examiner's rejection of Claims 1-3 under 35 U.S.C. 103 (a) as being unpatentable

over U.S. Patent No. 5,948,079 (Tsai) in view of U.S. Patent No. 6,529,518 B1 (Webber) is

hereby traversed and reconsideration is respectfully requested in view of the amendments to the

claims contained herein and the following remarks.

Applicants' Claim 1, as amended, is directed to a computer system, which has more than one computer connected to a storage system. Each computer has software that can send and receive information over a network. When the network is not available or is not desired to be used, the information that normally would be sent over a network is still able to be communicated between the applications on the computers by receiving transmission packets into an internal thread and placing the transmission packets into a queue determined by the type of transmission packet. If the transmission packet is a write packet, it is copied into a buffer, and upon the buffer being filled to a predetermined point, the internal thread awakes to process the filled buffer by writing the contents of the buffer to the data storage system.

Applicants' claimed novel systems and methods differ in a number of respects from those described in the Tsai reference or in the Webber reference. The Claims 1-3 describe a method, which provides a continuous availability of the network information without use of the network. Applicants respectfully submit that even if Tsai and Webber were combined, neither of the two, alone nor in combination, teach or suggest Applicants' invention as described in Claims 1-3. Accordingly, based on the above, Applicants respectfully request that the rejection of Claims 1-3 be withdrawn.

Applicants will first discuss the Tsai reference and the differences of Tsai with respect to Applicants' independent Claim 1 and the claims which depend from them. The Tsai reference discloses a computer network peripheral device that receives a plurality of data packets from a network of computers and transfers the data packets to a storage unit of a host computer system. The computer network peripheral device includes a respective register for storing each of the

plurality of data packets received from the network of computers and includes a data packet portioning unit. The peripheral device includes a buffer writer, coupled to the data packet portioning unit and the storage unit of the host computer system, for transferring the data packet portions of the plurality of data packets to the storage unit of the host computer system in non-sequential order. This is quite different for Applicants' invention described above.

Applicants respectfully disagree with the Examiner's assertion that the Tsai reference teaches or suggests that receiving transmission packets into an internal thread and placing the transmission packets into a queue determined by the type of transmission packet. In one aspect, described in Claim 1, when the network is not available or is not desired to be used, the information that normally would be sent over a network is still able to be communicated between the applications on the computers. The Tsai reference does not teach this.

Applicants respectfully agree with the Examiner that the Tsai reference fails to teach the step of upon filling the buffer to a predetermined point, waking the internal thread to process the filled buffer wherein the internal thread writes the contents of the buffer to the storage system as the Applicants' Claim 1 recited. Applicants respectfully point out that, because of this, Tsai cannot and does not teach or suggest any method that the information that normally would be sent over a network is still able to be communicated between the applications on the computer when the network is not available or is not desired to be used.

The lacking of teaching and suggestion of Tsai with respect to Applicants' invention are not overcome by also considering the teachings of Webber. The Webber reference discloses that the first requesting adapter may de-assert its pause request when its bypass buffer reaches a

threshold level rather than waiting until its bypass buffer is completely emptied. Webber cannot and does not teach or suggest any method that enabling an internal thread to process a filled buffer. Webber also cannot and does not teach or suggest any method that an internal thread writes the content of the buffer to the storage system.

Neither Tsai nor Webber teach or suggest that receiving transmission packets into an internal thread and placing the transmission packets into a queue determined by the type of transmission packet. Applicants respectfully submit that even if Tsai and Webber were combined, neither of the two, alone nor in combination, teach or suggest a continuous availability of the network information without use of the network. Because of Tsai and Webber do not teach or suggest Applicants' invention claimed in Claim 1, Applicants respectfully request reconsideration and removal of the rejection of Claim 1 for obviousness over Tsai in view of Webber.

Applicants' Claim 2 is directed submitting the transmission packets into a write buffer by a client thread before the internal thread receives transmission packets. Applicants respectfully disagree with the Examiner's assertion that the Tsai reference teaches or suggests that submitting the transmission packets into a write buffer by a client thread before the internal thread receives transmission packets. Instead, the Tsai reference merely shows that the buffer writer writes a data packet portion into a receiving buffer.

Applicants' Claim 3 is directed a step of calling a transport data function by the client thread when the transmission packets are extracted from the buffer. Applicants respectfully point out that the Examiner's assertions that the Tsai reference fails to teach the step of

processing the filled buffer in Applicants' Claim 3.   The Webber reference teaches transporting packets but that is not the same as processing a filled buffer in combination with Applicants' other steps.   Even if transporting a packet (Webber) were the same, it is impermissible hindsight to extract out of context one step from Webber in combination with Applicant's entire invention and does not render Applicants' Claim 3 obvious.   Applicants respectfully submit that even if Tsai and Webber were combined, neither of the two, alone nor in combination, teach or suggest Applicants' invention as described in Claims 2 and 3.   Accordingly, in view of the arguments above, Applicants respectfully request reconsideration and removal of the rejection of Claims 2 and 3 for obviousness over Tsai in view of Webber.

The Examiner's rejections of Claims 4-10 under 35 U.S.C. 103 (a) as being unpatentable over Tsai in view of Webber in further view of U.S. Patent No. 5,228,083 (Lozowick) is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein and the following remarks.

Applicants' Claim 4, as amended, is directed to the steps of configuring an application in advance such that the transmission packets are written by the application to a data storage system when the network is unavailable or failed.   Applicants respectfully agree with the Examiner that the combination of Tsai and Webber references fail to teach the step of writing the packets upon unavailability of the network as the Applicants' Claim 4 recited.

Applicants respectfully point out that, because of this, Tsai cannot and does not teach or suggest any method that the information that normally would be sent over a network is still able to be communicated between the applications on the computer when the network is not available or is not desired to be used.

The deficiencies of Tsai and Webber with respect to Applicants' invention are not overcome by Lozowick. The Lozowick reference discloses that data packets are forwarded immediately, i.e., spontaneously, unlike in Applicants' invention. The Lozowick reference also teaches steps of receiving inbound data packets from a communication network, determining whether a client interface is available and, if not, storing each inbound data packet in an inbound buffer memory. Then, when the client interface becomes available, the step retrieves a stored data packet. This is different from Applicants' invention as described above.

Applicants respectfully disagree with the Examiner's assertion that the Lozowick reference teaches steps of writing packets upon unavailability of the network. As clearly indicated in the Lozowick reference, the step in Lozowick waits until the client interface becomes available and retrieves a stored data packet only when the client interface becomes available. However, the Applicants' invention directed to the steps of configuring an application in advance such that the transmission packets are written by the application to a data storage system even when the network is not available or is not desired to be used. Applicants' invention is directed to a continuous write, whereas the Lozowick is not.

Applicants respectfully submit that even if Tsai, Webber, and Lozowick were combined, neither of the three, alone nor in combination, give motivation, teach or suggest Applicants' invention to one of ordinary skill in the art as described in Claim 4. Accordingly, based on the above, Applicants respectfully request that the rejection of Claim 4 be withdrawn.

Applicants' Claim 5 is directed to configuring the storage system to include a receive volume and a send volume and the contents of the buffer are written to a send volume and then

copy the contents of the send volume to the receive volume. This is also described more in detail in the paragraph [0042] of the specification of the Applicants' invention.

Applicants respectfully disagree with the Examiner's assertion that the combination of the Tsai with the other references teaches steps of Applicants' invention as described in Claim 5. The Tsai reference merely tells the buffer writer writes a data packet into a receiving buffer. Accordingly, based on the above, Applicants respectfully request that the rejection of Claim 5 be withdrawn.

Applicants' Claim 6 is directed to the receive volume and the send volume are respectively located on first and second logical volumes of the storage system.

Applicants respectfully disagree with the Examiner's assertion that the Tsai reference teaches Applicants' invention as described in Claim 6. The Tsai reference merely shows a buffer writer and a descriptor writer are located separately. The Tsai reference neither teaches the aspect of a receive volume and a send volume nor that the volumes are respectively located on first and second logical volumes. Accordingly, based on the above, Applicants respectfully request that the rejection of Claim 6 be withdrawn.

Applicants' Claim 7, as amended, depends from Claim 4. Since Claim 7 depends from Claim 4, Applicants respectfully submit that this claim is allowable for at least the same reasons as for Claims 1 and 4.

Applicants' Claim 8, as amended, is directed to configuring the storage system to include a receive volume and a send volume when the second storage system is geographically removed from the storage system and the contents of the buffer are written to a send volume and then copy the contents of the send volume to the receive volume.

Applicants respectfully disagree with the Examiner's assertion that the combination of the Tsai with the other references teaches steps of Applicants' invention as described in Claim 8. The Tsai reference merely tells the buffer writer writes a data packet into a receiving buffer.

Applicants respectfully agree with the Examiner that the combination of references fail to teach two separate volumes as the Applicants' Claim 8 recited.

Applicants respectfully point out that, because of this, Tsai cannot and does not teach or suggest any method that the information that normally would be sent over a network is still able to be communicated between the applications on the computer when the network is not available or is not desired to be used.

Applicants respectfully disagree with the Examiner's assertion that it would have been obvious to position the elements in the system, as part of a network, geographically apart from each other. Accordingly, based on the above, Applicants respectfully request that the rejection of Claim 8 be withdrawn.

Applicants' Claim 9 is directed to returning the internal thread to a sleep state, after the contents of the buffer are written to the send volume.

Applicants respectfully disagree with the Examiner's assertion that the combination of the Tsai with the other references teaches steps of Applicants' invention as described in Claim 9. Tsai does not teach returning the internal thread to a sleep state nor do the other references. Accordingly, based on the above, Applicants respectfully request that the rejection of Claim 9 be withdrawn.

Applicants' Claim 10 depends from Claim 9. Since Claim 10 depends from Claim 9, Applicants respectfully submit that this claim is allowable for at least the same reasons as for Claim 9.

Applicants respectfully submit that even if Tsai, Webber, and Lozowick were combined, neither of the three, alone nor in combination, teach or suggest Applicants' invention as described in Claims 4-10.

Accordingly, based on the above, Applicants respectfully request that the obviousness rejection of Claims 4-10 be withdrawn.

The Examiner's rejections of Claims 11-16 under 35 U.S.C. 103 (a) as being unpatentable over Tsai in view of Lozowick is hereby traversed and reconsideration and removal of the rejection is respectfully requested in view of the amendments to the claims contained herein and the following remarks.

Applicants' independent Claim 11 is directed to a computer system has a plurality of applications, each in communication with a storage system, and the applications each have a process capable of sending and receiving information over a network to one another. The present invention also has a method for providing continuous availability of the information even if the network is not available. The process recognizes that the network is not available, and in response to the unavailability the information that would normally have gone over the network is written from one of the applications to a first volume. The information is then written from the first volume to a second volume where it can be read from the second volume..

Applicants' novel systems and methods differ in a number of respects from those described in the Tsai reference or in the Lozowick reference.

Applicants respectfully disagree with the Examiner's assertion that the Tsai reference teaches or suggests that receiving transmission packets into an internal thread and placing the transmission packets into a queue determined by the type of transmission packet.

In one aspect, described in Claim 11, when the network is not available or is not desired to be used, the information that normally would be sent over a network is still able to be communicated between the applications on the computers. The Tsai reference does not teach this.

Applicants respectfully agree with the Examiner that the Tsai reference fails to teach the step of writing the packets upon unavailability of the network as the Applicants' Claim 11 recited.

Applicants respectfully point out that, because of this, Tsai cannot and does not teach or suggest any method that the information that normally would be sent over a network is still able to be communicated between the applications on the computer when the network is not available or is not desired to be used.

The deficiencies of Tsai with respect to Applicants' invention are not overcome by Lozowick. The Lozowick reference discloses that data packets are forwarded immediately. This is more likely a spontaneous process. The Lozowick reference also teaches steps of receiving inbound data packets from a communication network, determining whether a client interface is available and, if not, storing each inbound data packet in an inbound buffer memory. Then, when the client interface becomes available, the step retrieves a stored data packet. But this is very different from Applicants' claimed invention.

Applicants respectfully disagree with the Examiner's assertion that the Lozowick reference teaches steps of writing the packets upon unavailability of the network. As clearly indicated in the Lozowick reference, the step in Lozowick waits until the client interface becomes available and retrieves a stored data packet only when the client interface becomes available. However, the Applicants' invention directed to the steps of configuring an application in advance such that the transmission packets are written by the application to a data storage system even when the network is not available or is not desired to be used. The Applicants' invention directed to a continuous even for this step, whereas the Lozowick is not.

Applicants respectfully submit that even if Tsai and Lozowick were combined, neither of the two, alone nor in combination, give motivation, teach or suggest Applicants' invention to one of ordinary skill in the art as described in Claim 11. Accordingly, based on the above, Applicants respectfully request that the rejection of Claim 11 be withdrawn.

Applicants' Claims 12, 13, 14 and 15 depend from Claim 11. Since Claims 12, 13, 14 and 15 depend from Claim 11, Applicants respectfully submit that these claims are allowable for at least the same reasons as for Claim 11.

Applicants' Claim 16 is directed to a second storage system geographically remote from the storage system, wherein the first volume is on the storage system and the second volume is on the second storage system.

Applicants respectfully disagree with the Examiner's assertion that the combination of the Tsai with the other references teaches steps of Applicants' invention as described in Claim 16. The combination of the Tsai with the other references merely tells the buffer writer writes a data packet into a receiving buffer.

Applicants respectfully agree with the Examiner that the combination of references fails to teach two separate volumes as the Applicants' Claim 16 recited.

Applicants respectfully point out that, because of this, Tsai cannot and does not teach or suggest any method that the information that normally would be sent over a network is still able to be communicated between the applications on the computer when the network is not available or is not desired to be used.

Applicants respectfully disagree with the Examiner's assertion that it would have been obvious to position the elements in the system, as part of a network, geographically apart from each other. Accordingly, based on the above, Applicants respectfully request that the rejection of Claim 16 be withdrawn.

Applicants respectfully submit that even if Tsai and Lozowick were combined, neither of the two, alone nor in combination, teach or suggest Applicants' invention as described in Claims 11-16. Accordingly, based on the above, Applicants respectfully request that the rejection of Claims 11-16 be withdrawn.

The remaining references cited by the Examiner have been reviewed with respect to the claims as they remain in the case, and are not considered to adversely affect patentability of these claims.

In view of the foregoing, Applicants respectfully submit that the application is in condition for allowance and respectfully request favorable reconsideration and withdrawal of all outstanding objections and rejections.
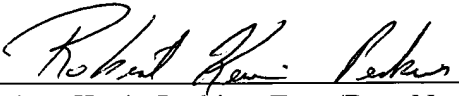
In the event the Examiner deems personal contact desirable in the disposition of this case, the Examiner is invited to call the undersigned attorney at (508) 293-6985.

Applicant: Robin Budd, *et al.*
U.S.S.N.: 09/895,466
Filing Date: June 29, 2001
EMC Docket No.: EMC-00-066

Please charge all fees occasioned by this submission to Deposit Account No. 05-0889.

Respectfully submitted,

Dated: _February 28, 2005_

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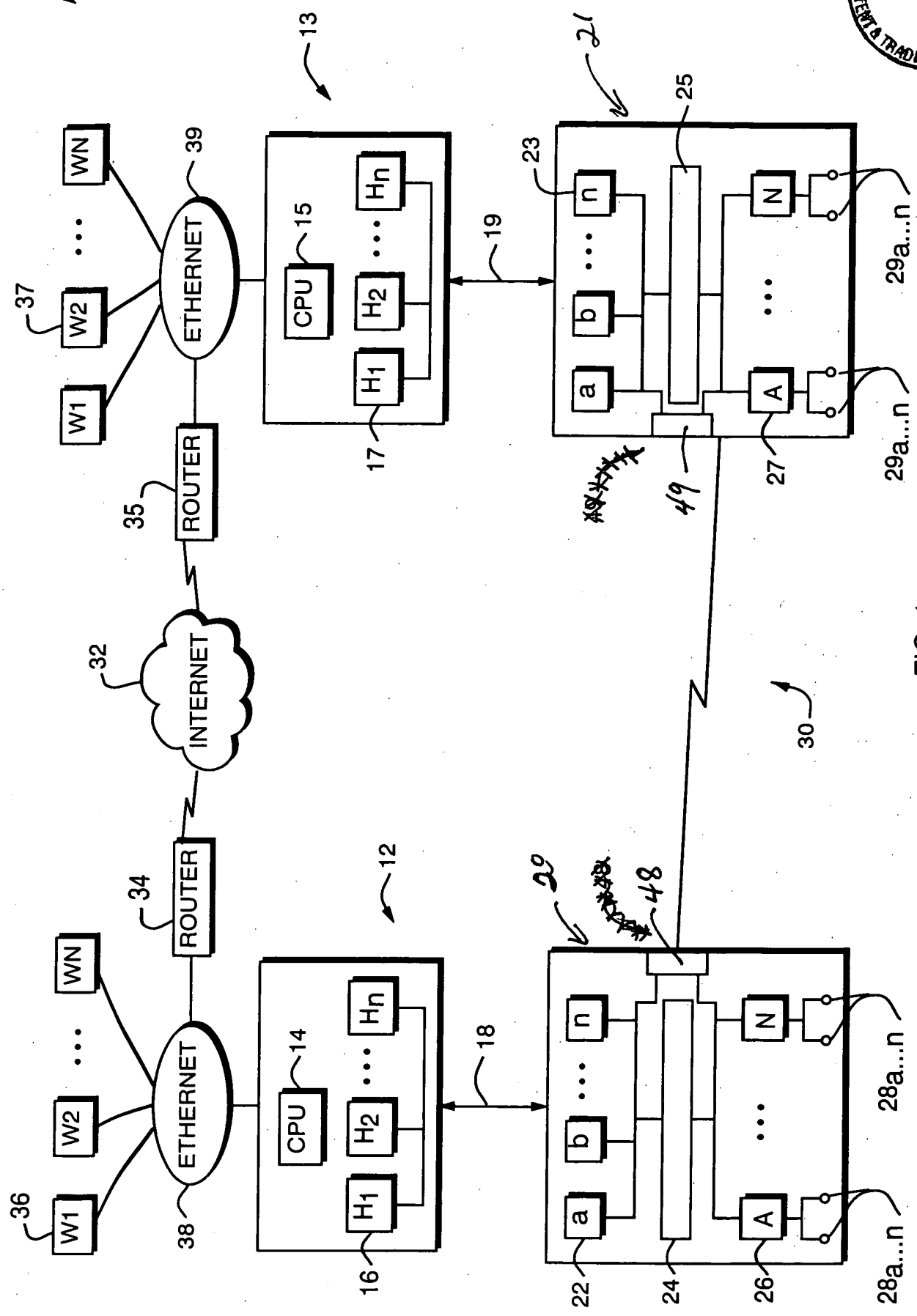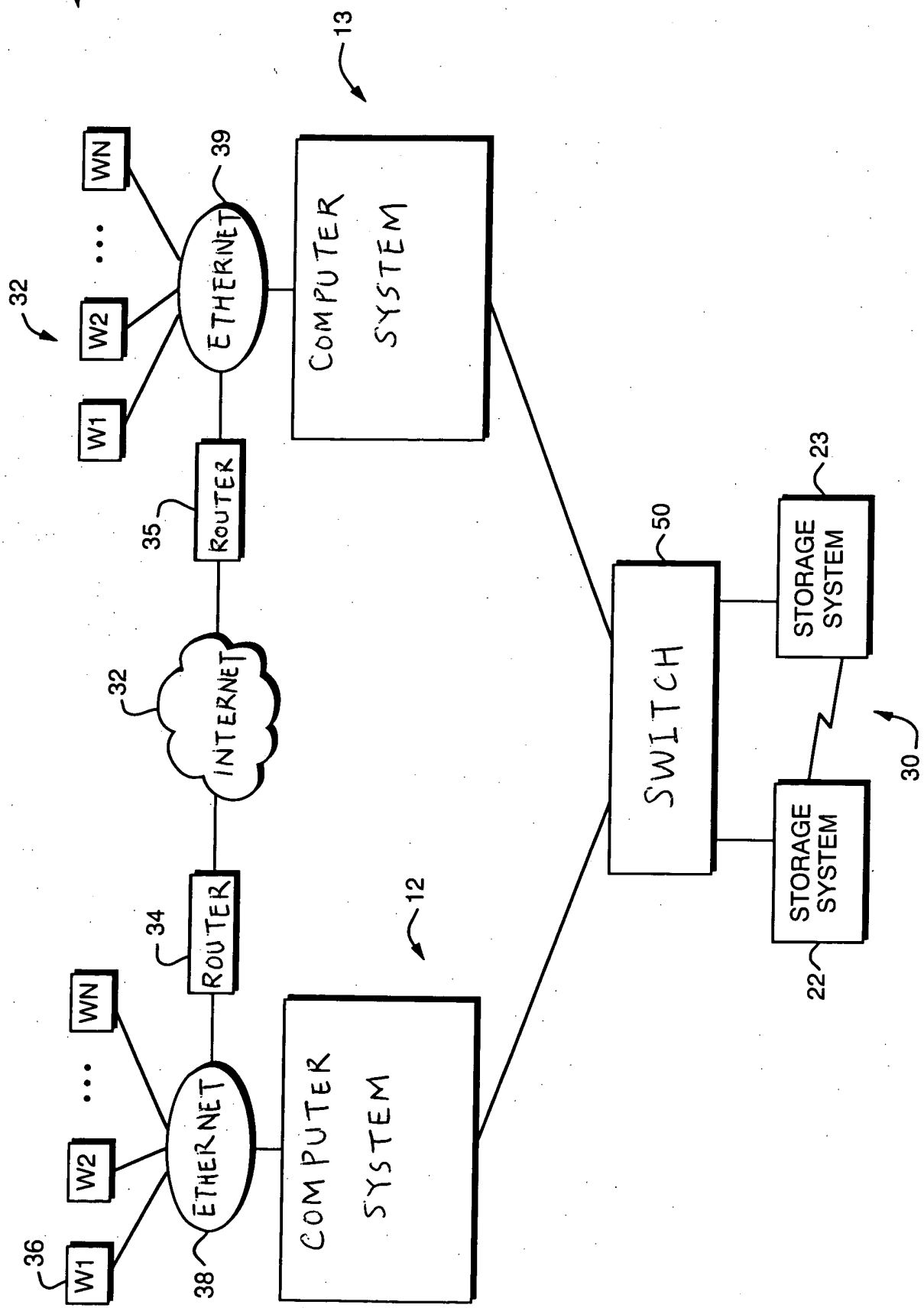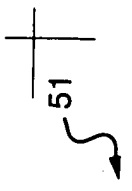Telephone: (508) 293-6985
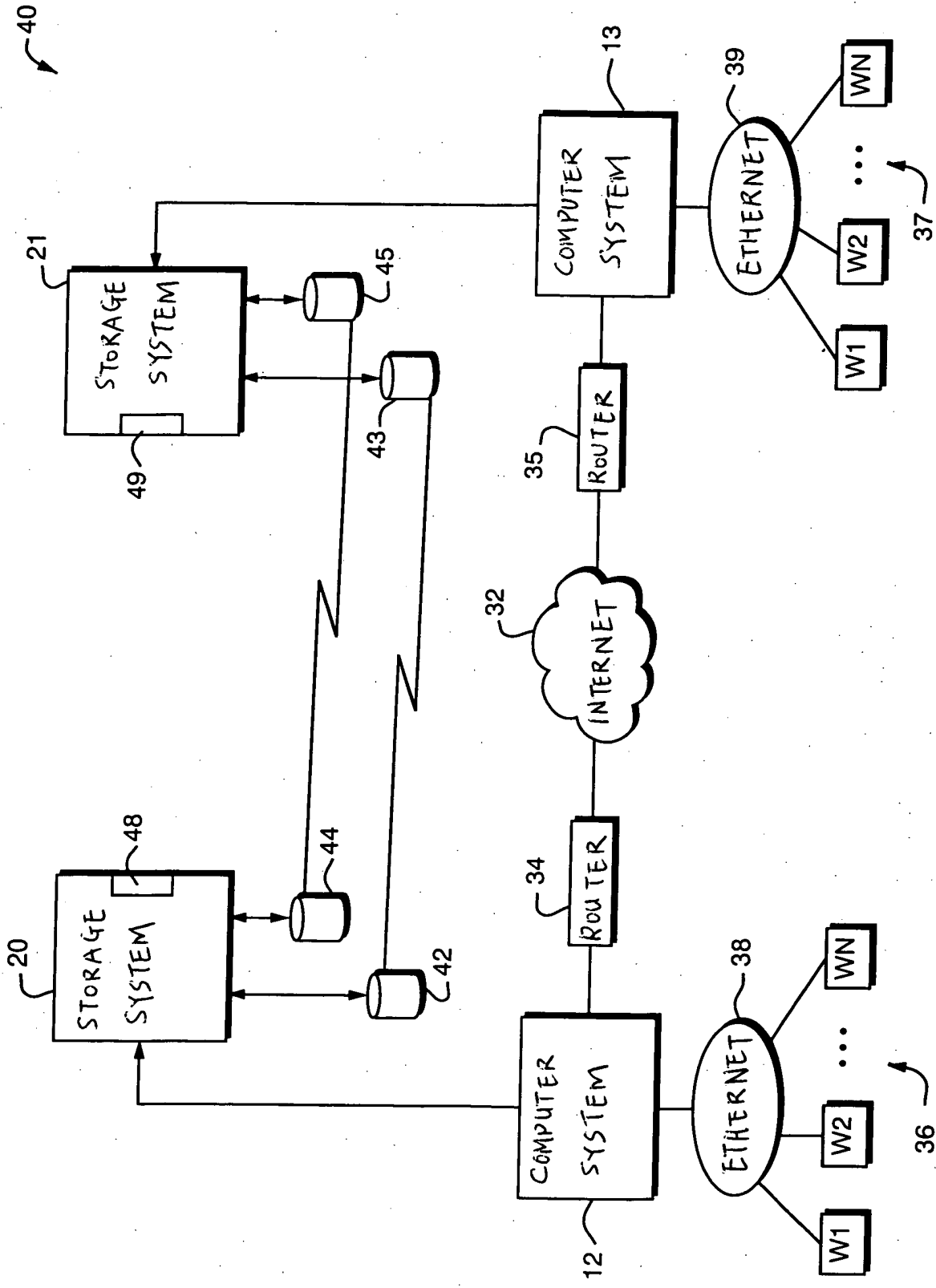Facsimile: (508) 293-7189

FIG. 1

FIG. 2

FIG. 3

FIG. 7